ADDITIONAL

Service Manual

PIONEER®

ORDER NO.
ARP-818-0

FM/AM DIGITAL SYNTHESIZER TUNER

TX-220Z ZEZ

TX-221Z ZEZ

- **For servicing these type, please refer to the F-X20ZL service manual (ARP-719) with the exception of this additional service manual.**

- This additional service manual is applicable to ZEZ type.

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1. SPECIFICATIONS

FM Tuner Section

Frequency range ..... 87.5 MHz to 108 MHz
Usable Sensitivity ..... 11.2 dBf, IHF (1.0 V/75 ohms)
Sensitivity (DIN) ..... Mono: 0.9 μV/75 ohms
Stereo: 31.5 μV/75 ohms
Signal-to-Noise Ratio (IHF, 85 dBf Input) ..... Mono: 77 dB
Stereo: 73 dB
Signal-to-Noise Ratio (DIN) ..... Mono: 66 dB
Stereo: 60 dB
Distortion ..... Stereo: 0.4% (1 kHz)
Alternate Channel Selectivity ..... 67 dB (400 kHz)
Stereo Separation ..... 40 dB (1kHz)
Antenna Input ..... 300 ohm balanced
75 ohm unbalanced

MW Tuner Section

Frequency range ..... 531 kHz to 1602 kHz
Sensitivity (IHF, Loop antenna) ..... 300 μV/m
Signbal-to-Noise Ratio ..... 50 dB
Antenna ..... Loop Antenna

Miscellaneous

Dimensions ..... 420(W) x 58(H) x 215(D) mm
Weight (without package) ..... 1.9 kg

Furnished Parts

FM T-type Antenna 1
AM Loop Antenna 1
Coaxial connector 1
Connection Cable 1

2. CONTRAST OF MISCELLANEOUS PARTS

TX-220Z/ZEZ and TX-221Z/ZEZ types are the same as the F-X20ZL/ZEB type with the exception of the following sections.

Mark	Symbol & Description	Part No.			Remarks
		F-X20ZL/ZEB	TX-221Z/ZEZ	TX-220Z/ZEZ	
	Tuner assembly	GWE-231	GWE-232	GWE-232	
	FE assembly	...	AWB-063	AWB-063	
	Connector socket	...	AKX-206	AKX-206	
	Bonnet case	ANE-529	ANE-597	ANE-597	
	Front panel	ANM-846	ANY-027	ANY-067	
	Display cover	ANR-968	ANZ-111	ANZ-129	
	Display cap	ANR-969	ANZ-130	ANZ-131	
	Coaxial connector	...	AKX-090	AKX-090	
	Packing case	AHE-463	AHE-595	AHE-596	
	Nut (M12)	...	NKX2FNI	NKX2FNI	(for connector socket)
	Washer	...	WAX3F176N050	WAX3F176N050	(for connector socket)

3. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561 ..... RD¼PS*	*5 6 1 J*
47kΩ	*47 × 10³*	*473 ..... RD¼PS*	*4 7 3 J*
0.5Ω	*0R5 ..... RN2H*		*0 R 5 K*
1Ω	*010 ..... RS1P*		*0 1 0 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621 .... RN¼SR*	*5 6 2 1 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

P. C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
	Tuner assembly	GWE-232
	FE assembly	AWB-063
	Switch assembly	Non supply
	LED assembly	Non supply

Tuner Assembly (GWE-232)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC301	AN7470
★★	IC401	LA1260
★★	IC702	TC9157AP
★★	IC701	TD6104P
★★	IC703	TD6301AP
★	D405, D605	RD5.6EB (HZ5.6EB)
★	D401, D402,	SVC321C2/D2
★	D301, D404, D406—D410, D702—D704, D707—D709	1S1555 (US1035) (1SS131)
★★	Q304, Q407, Q408, Q605, Q607	2SA933S
★★	Q301—Q303, Q401—Q404, Q608, Q606, Q701—Q707	2SC1740S
★★	Q201	2SC2668
★★	Q406	2SK161-Y (2SK241-Y)

SWITCHES

Mark	Symbol & Description	Part No.
★★	S3—S11, S15, S16 Tact switch (STATION CALL MEMORY FUNCTION)	ASG-711 (ASG-703)

COILS, FILTERS AND TRANSFORMERS

Mark	Symbol & Description	Part No.
	T401 AM antenna transformer	ATB-099
	L401 AM OSC coil	ATB-100
	L202 FM DET coil	ATE-072
	F202 FM ceramic filter	ATF-107
	F201 FM ceramic filter	ATF-119
	F401 AM ceramic filter	ATF-133
	F301 Beat eliminate filter	ATF-146
	L203 Inductor	ATH-116
	L201 Inductor	ATH-049

CAPACITORS

Mark	Symbol & Description	Part No.
	C713 (3300μF/10V)	ACH-389
	TC401, TC402 Trimmer	ACM-015
	C716	CCCCH180J50 (CCDCH180J50)
	C416, C718	CCCSL221J50 (CCDSL221J50)
	C401	CCDCH080D50
	C404, C717	CCDCH150J50
	C426	CCDSL101J50
	C422	CEANP4R7M35
	C308, C427	CEAR22M50L
	C425, C702, C709, C711, C712	CEA010M50L

Mark	Symbol and Description	Part No.
	C306, C705	CEA1R5M50L
	C418, C723	CEA100M16L
	C312, C313, C423	CEA2R2M50L
	C303, C604	CEA221M16L
	C301, C302, C307, C701	CEA3R3M50L
	C703	CEA330M16L
	C311, C414	CEA470M25L
	C720	CEA471M16L
	C714	CEA471M6L
	C309, C310, C410, C411	CKCYB102K50 (CKDYB102K50)
	C314, C315	CKCYB472K50 (CKDYB472K50)
	C316	CKCYB681K50 (CKDYB681K50)
	C305, C412, C413, C419, C710	CKCYF473Z50 (CKDYF473Z50)
	C415	CKCYX473M25 (CKDYX473M25)
	C201, C403, C420, C704, C706—C708, C721, C722, C724	CKDYF103Z50
	C214, C402, C407, C408, C715, C719, C320, C321	CKDYF223Z50
	C421	CQMA104J50
	C405	CQSA431J50
	C304	CQSA471J50

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★	VR401 Semi-fixed (220k)	VRTB6VS224
★	VR301 Semi-fixed (4.7k)	VRTB6VS472
⚠	R601	RS1LMF151J
	R720, R721 Resistor array	RA12S473J
	R421, R431, R432, R404	RD1/4PM□□□J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	Termianl (ANTENNA)	AKA-024
	Terminal (AC and DC power supply/output)	AKP-083
★	V1 FL tube	AAV-028
	X701 Crystal resonator	ASS-025
	FE assembly	AWB-063

Switch Assembly

SWITCHES

Mark	Symbol & Description	Part No.
★★	S12, S13 Tact switch (TUNING)	ASG-711 (ASG-703)

LED Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D902 LED	AEL-424
★	D901 LED	AEL-382

FE Assembly (AWB-063) (on the GWE-232)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D101—104	1SV147
★★	Q102	2SC2668
★★	Q105	2SC2786-L
★★	Q101, Q103, Q104	2SK241-Y
★	D110	ISS131

COILS AND TRANSFORMERS

Mark	Symbol & Description	Part No.
	L101 FM antenna coil	ATC-192
	T101 FM RF transformer	ATC-194
	L104 FM OSC coil	ATC-214
	L103 FM RF coil	ATC-247
	L102 FM tuning coil	ATC-248
	T102 FM coupling transformer	ATE-063
	L105, L106 Inductor	ATH-049

CAPACITORS

Mark	Symbol & Description	Part No.
	TC101 Trimmer	ACM-014
	C115	CCDCH080D50
	C113	CCDCH150J50
	C114	CCDCH330J50
	C101	CCDRH100D50
	C105	CCDRH330J50
	C102, C104, C106	CCDRH390J50
	C108, C110	CCDSL010C50
	C109	CCDSL020C50
	C117	CCDSL050C50
	C111	CCDSL101J50
	C116	CCDTH180J50
	C103, C112, C118, C119	CKDYF103Z50
	C107	CKDYF223Z50
	C130	CEA470M25L

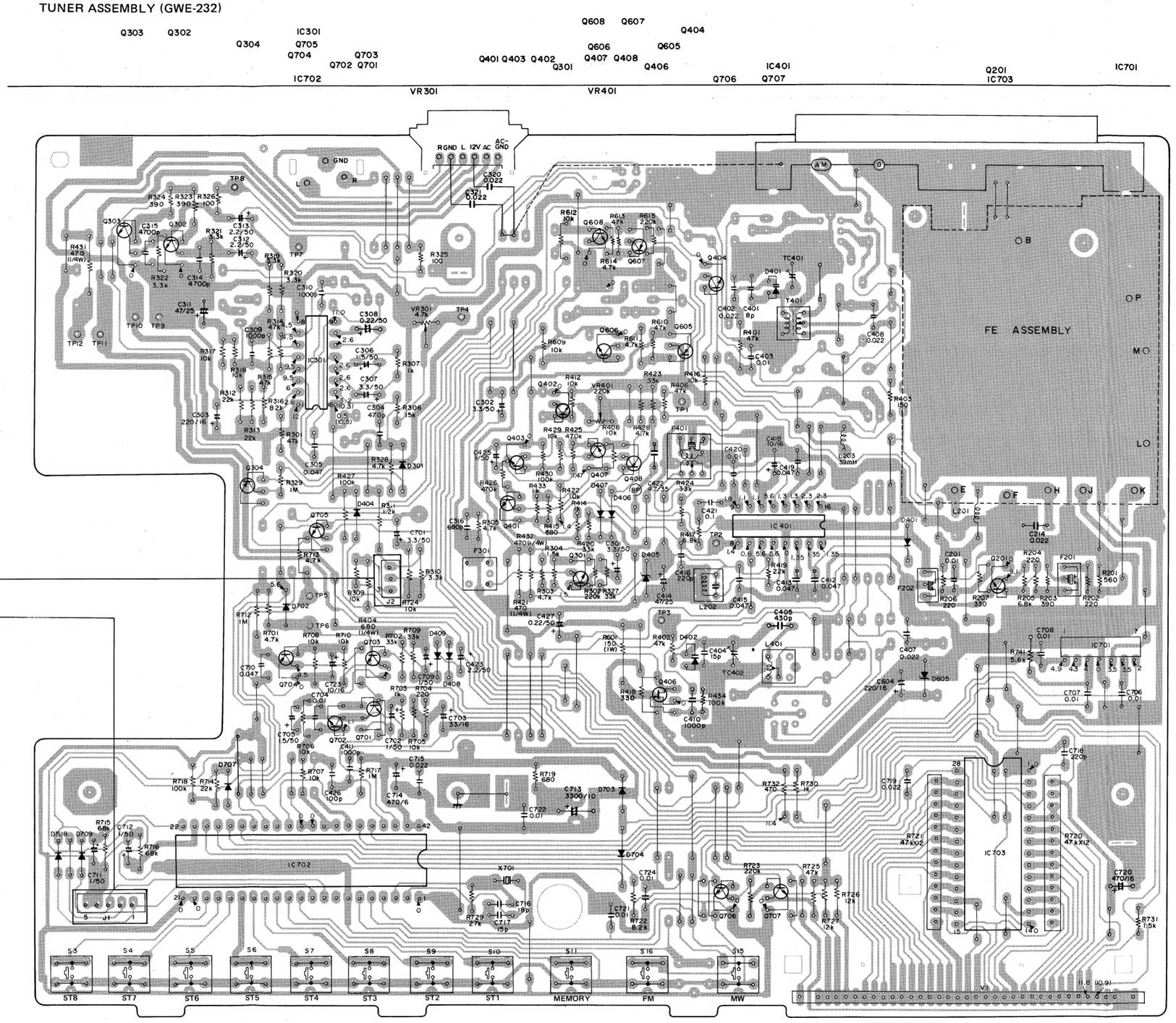
RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

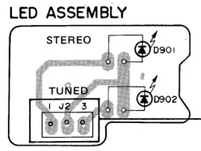
Mark	Symbol & Description	Part No.
	All resistors	RD1/8PM□□□J

4. P.C. BOARDS CONNECTION DIAGRAM

TUNER ASSEMBLY (GWE-232)

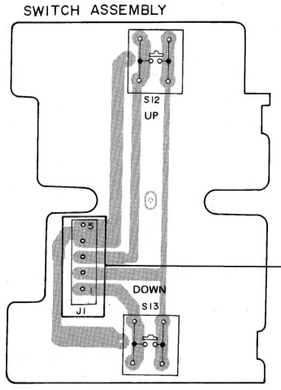


LED ASSEMBLY



D901 AEL-382
D902 AEL-424

SWITCH ASSEMBLY



IC 301: AN7470
IC 401: LA1260
IC 701: TD6104P
IC 702: TC9157AP
IC 703: TD6301AP

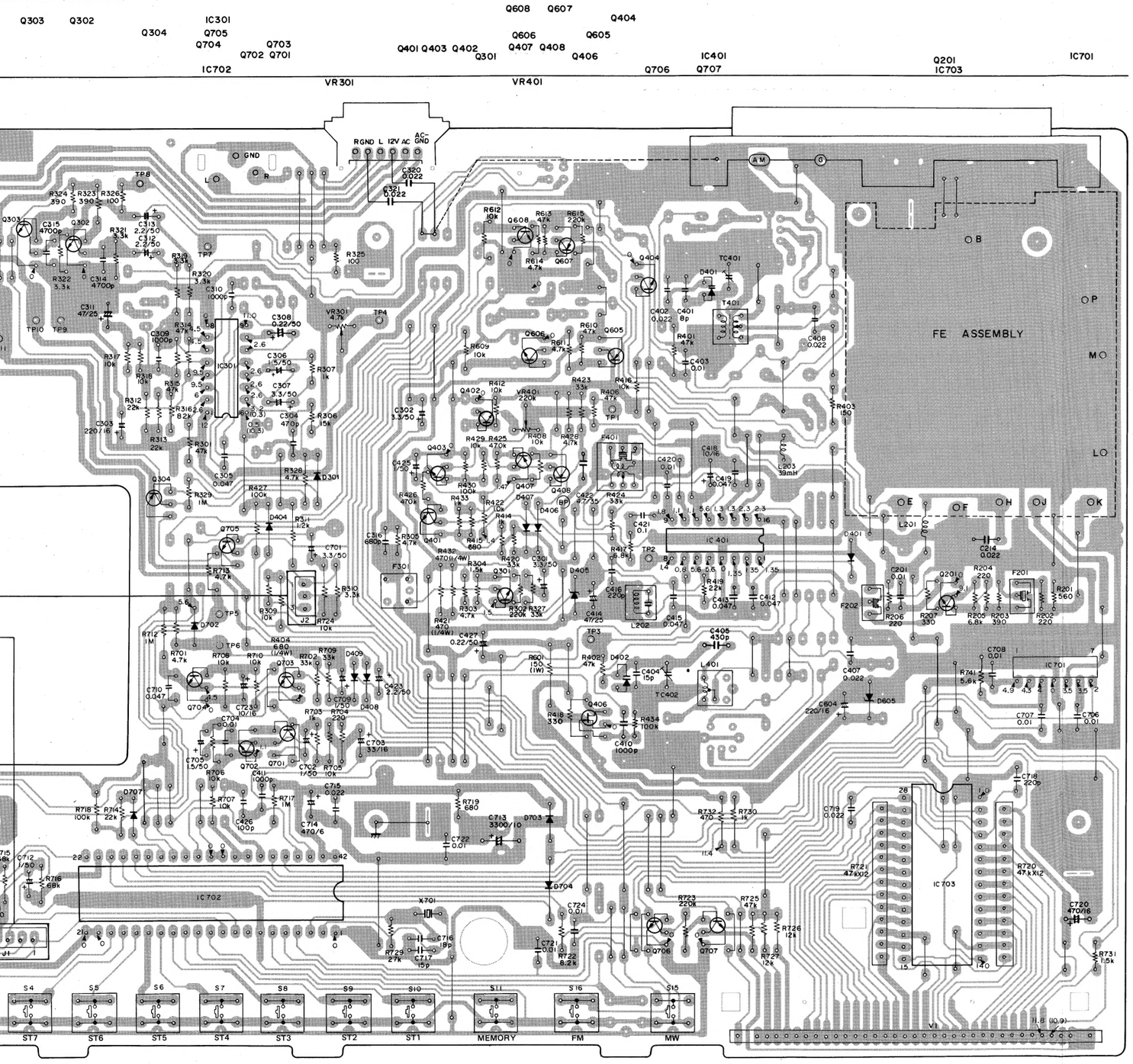
Q201: 2SC2668
Q406: 2SK161-Y (2SK241-Y)
Q301,302,303
401-404, 606,608
701-707:
2SC1740S
Q304,407,408
605,607:
2SA933S

D301,404,406-410
702 704,707 709
1SI555
(US1035)
(ISS131)

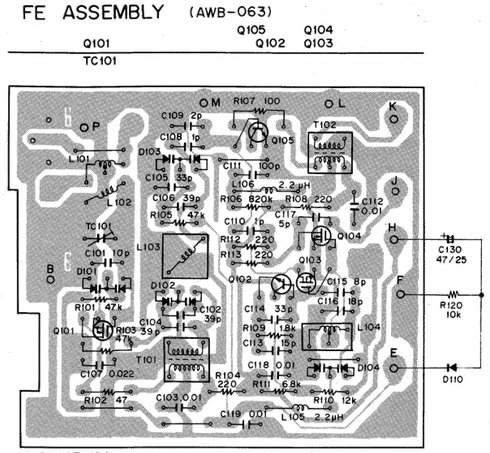
D405,605:
RD5.6EB
(HZ5.6EB)

D401,402:
SVC321C2/D2

SSEMBLY (GWE-232)

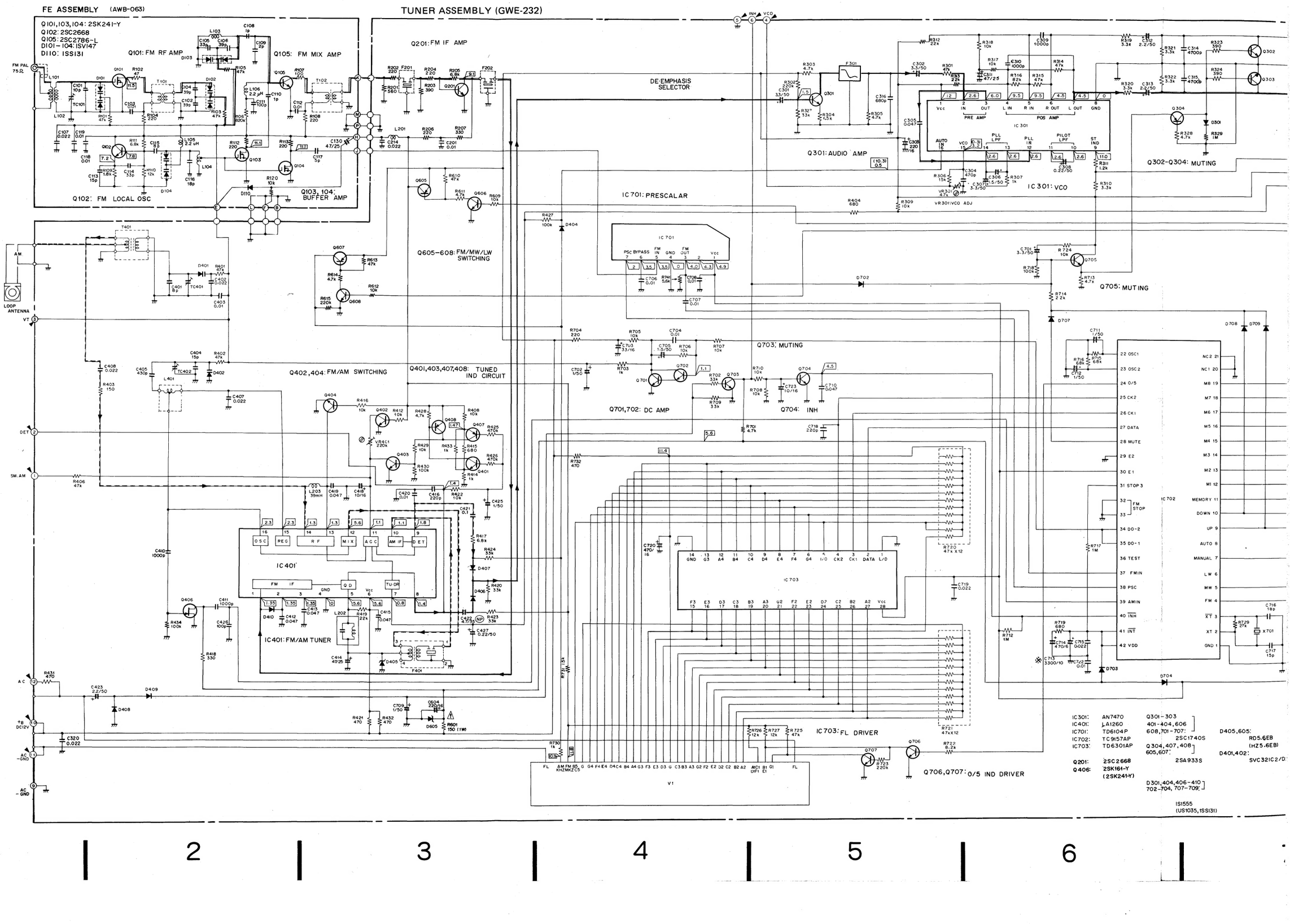


FE ASSEMBLY (AWB-063)



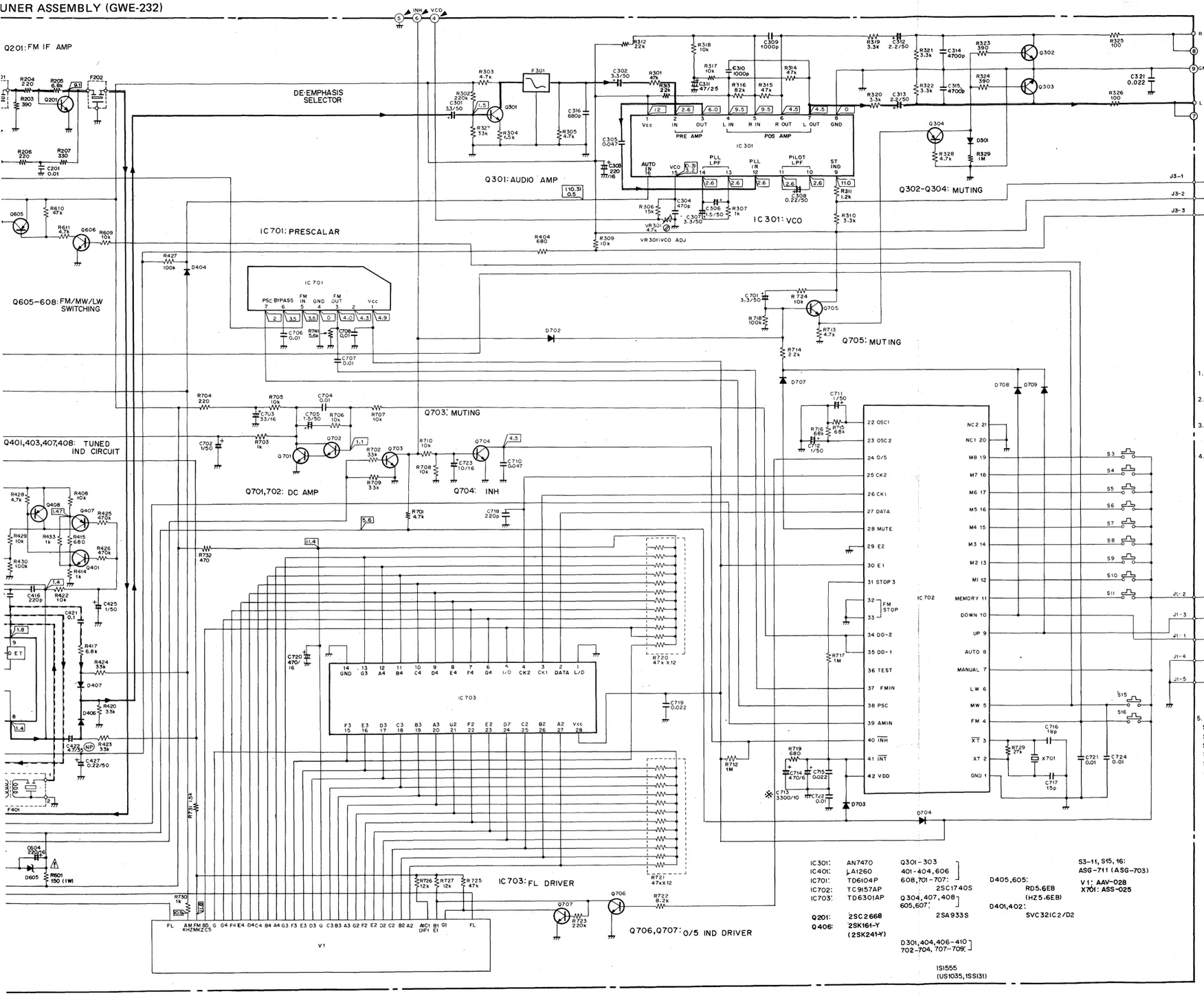
Q101, 103, 104 2SK241-Y
Q102 2SC2668
Q105 2SC2786-L
D101 ~ 104 1SV147
D110 1SS131

5. SCHEMATIC DIAGRAM



NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

TUNER ASSEMBLY (GWE-232)



1. RESISTORS:
   Indicated in Ω, 1/4W and 1/8W, ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance
2. CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE, CURRENT:
   ; DC voltage (V) at no input signal .
   ; DC current at no input signal .
   mV: Signal voltage at FM 1kHz ± 75 kHz DEV.
4. OTHERS:
   ➡ : Signal route.
   ⊘ : Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
   ※ marked capacitors and resistors have parts unmbers.

5. SWITCHES:

S3	STATION CALL 8	NORMAL	OFF
S4	STATION CALL 7	NORMAL	OFF
S5	STATION CALL 6	NORMAL	OFF
S6	STATION CALL 5	NORMAL	OFF
S7	STATION CALL 4	NORMAL	OFF
S8	STATION CALL 3	NORMAL	OFF
S9	STATION CALL 2	NORMAL	OFF
S10	STATION CALL 1	NORMAL	OFF
S11	MEMORY	NORMAL	OFF
S12	UP	NORMAL	OFF
S13	DOWN	NORMAL	OFF
S15	MW	NORMAL	OFF
S16	FM	NORMAL	OFF

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

6. ADJUSTMENTS

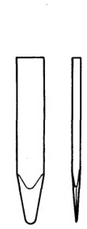
■ **For servicing this type, please refer to the F-X20ZL adjustments in service manual (ARP-719: from page 17 to 22) with the exception of this adjustment.**

● FM Tuner Section Adjustment

Step No.		FM SG (1 kHz±75 kHz dev.)		TX-221Z/ZEZ TX-220Z/ZEZ tuned frequency display	Adjustment	
		Frequency (MHz)	Level (dB)		Adjustment location	Specifications
3	①	90	20—30	90	L102*, L103, T101	Set the output from pin 1 of the tuner assembly to maximum level. (Before performing the adjustment of Step 3, turn VR401 fully counterclockwise.)
	②	106		106	TC101, L103, T101	
	③	90		90	L102*	
	④	Repeat steps 3-② and 3-③ until both specification ratings are satisfied.				

* The expression "adjust L102" found in the text means that the tuning coil is to be extended out wards with spatula (non metal) as shown in Fig. 6-2.

• Spatula (Non metal: ex. Glass-Cloth Epoxy Resin)



Use a spatula whose an edge is thin.

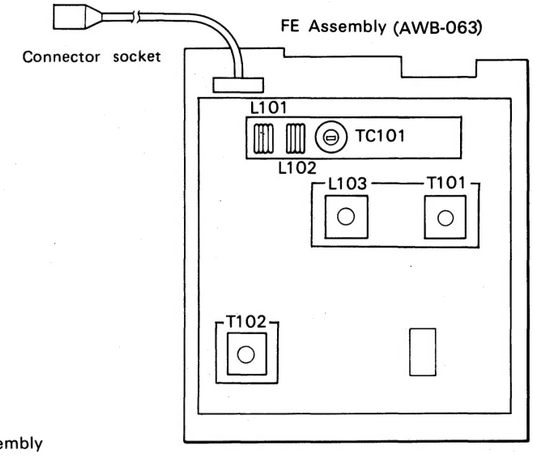
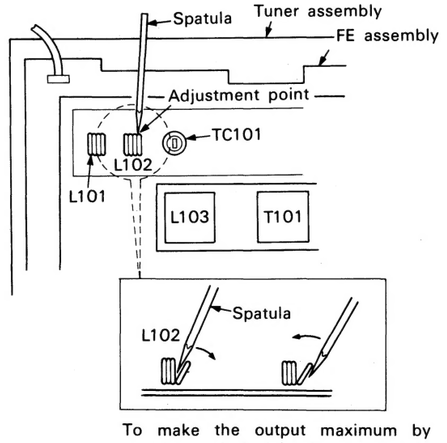


Fig. 6-1 Adjustment positions



To make the output maximum by opening and closing of the first right side turn of the coil.

Fig. 6-2 Adjustment tuning coil L102